



PIER Energy System Integration Program Area

Sagging Line Mitigator (SLiM) Full Scale Demonstration

Contract #: 500-01-025 **Work Authorization #:** E2I-WA-006

Contractor: Electricity Innovation Institute

Subcontractors: Material Integrity Solutions, Inc.

Project Amount: \$83,720

Contractor Project Manager: Rambabu Adapa (650) 855-8988

Commission Contract Manager: David Chambers (916) 653-7067

Status: Active

Project Description:

Excessive transmission line sag is one of the most prevalent causes for limiting line ampacity and has reportedly resulted in numerous power system outages, particularly for lines rating of 230kV (kilovolts) and below. Thermal expansion of the conductor resulting from high ambient temperatures, low winds, and high line current can lead to excessive line sag. Increases in demand, especially on hot summer days, increases the likelihood of excessive sag and the associated reliability issues.

The Sagging Line Mitigator (SLiM) is a new class of transmission line hardware that fixes the problem by reducing excessive line sag at just the right time. Using state-of-the-art materials and a tested and proven concept, SLiM reacts to increasing conductor temperature by decreasing the effective length of conductor in the span. This mitigates the natural thermal expansion experienced by the conductor during high temperature operation. The impact is to decrease line sag during such operations, which depending on construction specifics can cascade through several adjacent spans.

This project will evaluate the performance of the SLiM on an operating transmission line.

The Energy Commission has provided additional funding for this project so that utility representatives from Pacific Gas and Electric, San Diego Gas and Electric and Southern California Edison can also participate.

This project contributes to the PIER program objective of:

- Connecting to near-term market applications by providing utilities with first-hand information on the operational performance of this new transmission line hardware device. Additionally, the results of this project will position participating utilities as informed buyers and users of this new technology.

Proposed Outcomes:

1. This project will provide participating utilities with first-hand information on the operational performance of this new transmission line hardware device. The demonstration is designed for operation during one "hot" season. The length of the trial can be extended, if necessary, with the cooperation of the host utility.
2. The project will also compile practical "engineering-type" information to aid utilities in designing, specifying, installing, inspecting, and maintaining this device. The results of this project will position participating utilities as informed buyers and users of this new technology. This project is a collaborative project with National Grid –UK, BC Hydro, SDG&E, SCE, PG&E, and Public Service of New Mexico.

Project Status:

This project was completed on time and on schedule. The final report is expected to be published March 22, 2005 on the PIER website.